

## Relationship between Cervical-Uterine Cytology (CC) Results and Body Mass Index (BMI) in Rural Women: A Multivariate Analysis

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### Abstract

Cervical cancer in the female population in our country is presented by sexual transmission of persistent infection of the Human Papillomavirus (HPV), the results of cervical-uterine cytology in time is a key element for the reduction of morbidity and mortality rates of this disease. The general objective of this study was to contribute to the prevention of cervical cancer in women of childbearing age in Montes de María (Sucre-Colombia). It seeks to estimate factors (sexual health, socio-demographic, anthropometric and lifestyle) that are associated with the risk of this disease. Statistical analysis of categorical data comprises: 95% CI and Chi-square tests for bivariate analysis; Multiple Correspondence Analysis for a multivariate description of the study variables, accompanied by classification of agglomerative cluster of Euclidean distances linked to Ward's method; Finally, Logistic Regression to estimate the effect of explanatory variables with the presence of abnormal cytology. Statistical analysis was performed in R software. 10% reported that it was abnormal among women who claimed the result of the last cytology, 60% of rural women do not do physical activity and are malnourished with a tendency to overweight and obesity. Low education has as a consequence, low income reflected in a poor socio-economic condition, which shows association with high BMI, which potentiates negative effects on eating habits, adapted to the consumption of foods with low nutritional or energy value such as carbohydrates (tubers) and saturated fats that occur in this area and is within reach of their pockets. The care and promotion of women's well-being and health are presented to us as a fundamental axis when we consider health promotion interventions at the community level.

**Keywords:** Cervical Lesions; Associated Factors; Rural Women; Categorical Data

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### Introduction

Cancer is considered a multifactorial pathology, among the risk factors that have been identified that influence the development of cancer are tobacco and alcohol consumption, obesity, infections and physical inactivity, among others [1]. In the world, cervical cancer is the third most common type of cancer in women, after skin and breast cancer. 80% of cervical cancers diagnosed each

year occur in developing countries and survival in years is only close to half, compared to more developed countries. In Colombia it is the second female cancer after breast cancer, with an adjusted incidence of 36.4 per 100,000 and is the leading cause of death in women [2]. According to the Colombian League Against Cancer, every 3 hours a woman dies in our country from cervical-uterine cancer, being the first cause of mortality in women between 35 and 64 years of age; an incidence of 7000 cases is registered and 3300 women die from this pathology annually. In 2008, about 800 thousand new cases were diagnosed, of which 50% had a fatal outcome [3].

Several factors have been established that influence the appearance of cervical neoplasms among these: sexual activity at an early

age, infectious agents (herpes simplex virus, Epstein-Barr virus and HPV), smoking, immune status and genetic predisposition [4]. It is well established that screening for cervical cancer, along with appropriate treatment, can lead to significant reductions in mortality rates globally. However, the problem is aggravated because half of the women who undergo the examination do not claim the results, so we can notice that despite the availability of cytology since the early seventies in Colombia, cervical cancer is still an important cause of mortality in our country, According to the National Demographic and Health Survey (ENDS) mentions that women who have never had a cytology live especially in rural areas and in areas with a lower wealth index, barriers associated with age, marital status, educational level, grief, fear of pain, among others, are also mentioned.

Finally, it should be noted that the scarce information on the health and nutrition profile of women in Colombia and the few epidemiological statistics that reveal the relationship between their diet and other lifestyle factors highlight the need for updated data using appropriate statistical methodologies (Statistical Analysis) and free software that allow us to show dynamic results such as the R program. This study seeks to estimate that the practice of cytology increases with age, with educational level, with the wealth index, among other things.

## Methodology

The population of the department of Sucre is approximately 399,802 women. For the study carried out in the rural area of the municipality of Los Palmitos (Sucre-Colombia), 30 women were taken. An analytical study will be carried out, with descriptive design and quantitative approach where it seeks to contribute to the prevention of cervical cancer in women of childbearing age of the Montes de María (Sucre- Colombia). For the realization of this study, it is based on the information obtained in the Survey carried out by the Convention Project No. 1377: "Reconstruction of the social fabric from a comprehensive intervention and mathematical literacy in children aged 9-12 years of the rural educational institutions of the Montes de María", socio-economic and anthropometric variables were taken. Sexual health, healthy lifestyle habits and also results of cytology to evaluate the quality of the samples, it should be noted that women of childbearing age were included, in accordance with the provisions of the National Technical Standard for Early Detection of Cervical Cancer. For the treatment of the data, a statistical analysis of the categorical data was carried out, comprising: 95% CI and Chi-square tests for bivariate analysis; Multiple Correspondence Analysis for a multivariate description of the study variables, accompanied by classification of agglomerative cluster of Euclidean distances linked to Ward's method; Finally, Logistic Regression to estimate the effect of explanatory variables with the presence

of abnormal cytology, for the execution of the statistical analysis the R software (2018) was used together with the packages: ade4 (Chessel., *et al.* 2005), Facto Class (Pardo and Del Campo 2007) and xtable (Dahl., *et al.* 2009), among others [5-9].

## Results

In figure 1, the plane 1-2 of the Multiple Correspondence Analysis is presented, we find that

- When analyzing the upper and lower right part of the graph, it is inferred that the vast majority of women are between 40 and 69 years old who are in old age, have completed secondary and vocational education, are married women or are in a free union; Their occupation is to be housewives so they are not salaried and thus do not contribute a monthly income to their homes.
- They do not have an appropriate BMI for their height and weight, since they are obese or overweight which indicates that they do not manage a healthy diet in their homes so they are malnourished, which leads them to have an excess of adipose tissue in their bodies; Most of them say they do not consume alcohol and do not perform any physical activity.
- The age of initiation of sexual relations for most women ranges from 15 to 19 years, which indicates that they began their sexual life at an early age; Women have had 3 or more children, which tells us that their level of education and employment status is low; with respect to the number of sexual partners in their lifetime it is noted that women have had two or more sexual partners.
- Most women claim not to use any method of sexual planning, which in some ways justifies the number of children they have, The most performed cervical procedure by

These are colposcopy, biopsy, cauterization and hysterectomy, which are medical procedures used for the elimination of malignant cells or infectious agents in the cervix; and the most found microorganism is bacterial vaginitis which is a bacterial infection that occurs when the balance between the different types of healthy bacteria that are in the vagina is lost, caused by *Gardinerella vaginalis*.

In the upper left we find

- They are women who are 30 years of age or younger, even in childbearing age; But when analyzing their level of schooling we note that they have only reached their primary school so we can say that it is low with respect to the women previously analyzed; all women claim to live in a free union or are married; most of them are housewives who take care of their children, house and husband; They have normal bone mass index that is according to their height and weight, so it could be said

**Figure 1:** Analysis of auto metric sociodemographic variables, lifestyles and sexual health.

that they consume the amount of carbohydrates, proteins, among others, necessary daily; But at the same time they state not to consume alcohol or practice any physical activity.

- They started their sex life at the age of 15 to 19, so we can say that they started it at an early age but claim to have only one sexual partner in their life; Although they indicate not to use any type of contraceptive method, their number of births is low, since they have had at most two children; no procedure has been performed on their cervix, indicating that they have not had or had any sexually transmitted diseases; All have microorganisms whether lactobacilli or fungi that are the most persistent among these women these are due to the lack of hygiene in their genitals or intimate clothing.

## Conclusions

Cervical cancer is one of the pathologies that has increased over the years in developing countries, in relation to its incidence and mortality; which ranks second in cancer death in women in Colombia. In contrast to the decrease of this pathology in women living in developed countries, which have managed to reduce the mortality rate from cervical cancer due to the implementation of screening programs with uterine cervical cytology, which has proven its effectiveness. So international organizations such as WHO, PAHO, among others; They promote universal policies that guide health service providers to implement measures in this regard.

From this research carried out among rural women, it was found that low schooling and lack of employment are social conditions mainly associated with displaced rural populations, as other studies have shown and can become a barrier to accessing adequate health services. Low schooling can be associated with misinformation of this group of women regarding the meaning of cytology for their sexual and reproductive health, or ignorance about

the protocols to follow for the early detection of cervical cancer, although it is noted that the vast majority of women practiced cytology properly, Since the examination had been carried out in the last three years, presenting in its latest results a great variety of microorganisms, which can become malignant if they are not fought in time, such as the presence of fungi, lactobacilli, etc., the presence of these in the cervix is due to lack of hygiene or sexual promiscuity.

So there is a need to promote appropriate sexual and reproductive health practices in women to promote the early detection of cervical cancer, in addition to putting into practice good habits to lead a healthy life and thus maintain an adequate BMI, without neglecting the importance of genital cleaning.

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